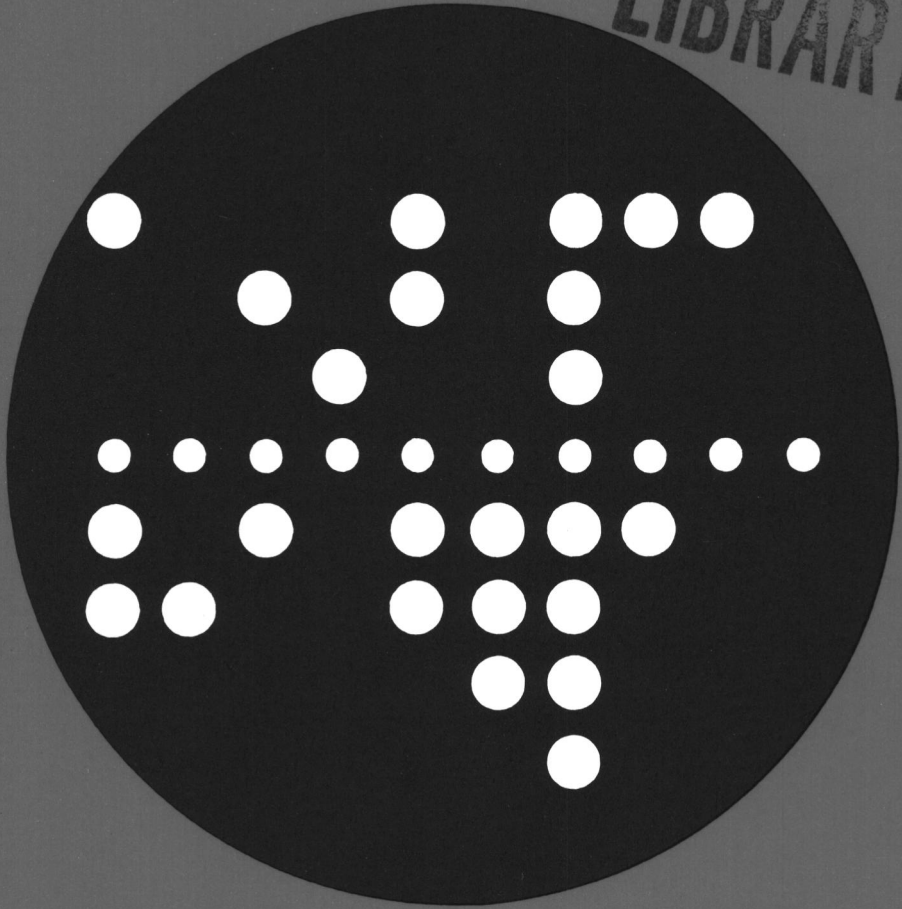


COMPUTING CENTRE NEWSLETTER

September 1980 - N. 44

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CONTENTS

Editorial Note	2
Un nouvel ordinateur a Ispra	3
L'ordinateur IB! 370/165 du Centre de Calcul	4
QED Notes	9
QED Manuals	23
Errata Corrige	23
Statistics of Computing Installation, July	24
Utilisation by Objectives & Accounts, July	25
Statistics of Batch Processing, July	26
Statistics of Computing Installation, August	27
Utilisation by Objectives & Accounts, August	28
Statistics of Batch Processing, August	29
Histogram of Equivalent Time Usage	29
List of Personnel	30

EDITORIAL NOTE.

The Computing Centre Newsletter is published monthly except for August and December.

It describes developments, modifications and specific topics in relation to the use of the computing installations of the Joint Research Centre, Ispra Establishment.

The aim of the Newsletter is to provide information of importance to the users of the computing installations, in a form which is both interesting and readable.

The Newsletter also includes articles which are of intellectual and educational value in order to keep the users informed of new advances in computer science topics.

The Editorial Board is composed as follows:

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New Computer..AMDAHL 470/U7A..New Computer
New Computer..AMDAHL 470/U7A..New Computer
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..AMDAHL 470/U7A..

New Computer..AMDAHL 470/U7A..New Computer
New Computer..AMDAHL 470/U7A..New Computer

UN NOUVEL ORDINATEUR A ISPRA

J. Pire

En comblement a notre article paru dans le numero de Juillet, nous avons le plaisir d'informer nos utilisateurs que le materiel AMDAHL a passe la douane de l'Etatblissement le 21 Aout et est entre en fonction le 25 Aout.

Depuis cette date tous les travaux du Centre de Calcul sont effectues exclusivement par la nouvelle unite centrale.

Aucune modification du logiciel utilisateur n'a ete necessaire; la transformation a donc ete executee de maniere entierement transparente.

Nous reviendrons plus longuement sur la question dans un prochain numero.

New Computer..AMDAHL 470/U7A..New Computer
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L'ORDINATEUR IBM 370/165 DU CENTRE DE CALCUL

Un coup d'œil sur le passé.

J. Piro

L'ordinateur I.B.M. 370/165 a terminé sa carrière.
Installé en Août 1972 il a fourni 8 années de bons et loyaux services.

Lors de son installation, il était pourvu de 1 Mb de mémoire centrale et il était prévu d'étendre à 2 Mb cette capacité dans les 6 mois suivant l'installation, c'est-à-dire début 1973.

Les unités périphériques étaient à l'époque formées de

- 2 lecteurs perforateurs de cartes
- 3 imprimantes à 1200 lignes par minutes (encore en service)
- 1 lecteur de bandes perforées
- 1 perforateur de bandes papier (renvoyé et non remplacé)
- 7 unités à bandes magnétiques à 9 pistes
- 1 unité à bandes magnétiques à 7 pistes
- 1 tambour IBM 2305-1
- 16 "spindles" 2314 de 25 Megabytes
- 8 "spindles" 3330 mod. 1 de 100 Megabytes, soit une capacité totale en access direct de 1200 Megabytes
- 1 unité de contrôle de télécommunication gérant environ 30 lignes

Ce matériel était insuffisant sous 3 points de vue:

- capacité de la mémoire centrale
- capacité des unités à accès direct
- gestion de lignes de télécommunication

Il a fallu attendre trois ans (1975) avant qu'un accord soit obtenu pour augmenter la configuration et ce n'est qu'en 1976 que du nouveaux matériel a pu être installé:

- le tambour a été remplacé par un IBM 2305-2
- la mémoire centrale a été progressivement agrandie jusqu'à 4 Megabytes
- la capacité des unités à disques a progressivement été portée à 4200 Megabytes
- l'unité de contrôle de lignes supporte actuellement une centaine de lignes

Charge globale

Les figures 1, 2 fournissent quelques indications concernant l'évolution dans le temps du travail effectué par l'ordinateur.

Ces figures fournissent par trimestre la valeur moyenne mensuelle de différents paramètres depuis le dernier trimestre 1972 (c'est -à-dire immédiatement après l'installation) jusqu'en juin 1980 (dernier trimestre complet d'exploitation).

La figure 1 fournie les paramètres suivants:

nombre de travaux batch (JOBS)
nombre d'I/O
temps équivalent (CPU 7X10 I/O disques 3x10 I/O bandes)
temps CPU utilise en batch en mode problème

Il est aisé de voir que le nombre de travaux batch exécutés est passé par un maximum en 1976-77 et depuis est en décroissance; ceci est dû au fait que les petits travaux sont de plus en plus exécutés en mode conversationnel (T.S.O.).

Le nombre de I/O à partir de 1974 fluctue saisonnièrement mais sans tendance générale notable à l'augmentation ou à la diminution.

- Le temps équivalent produit est en augmentation assez régulière.
- Le temps CPU fourni marque une augmentation lente jusqu'en fin 1975 car l'exploitation efficace de l'unité centrale était empêchée par le manque de mémoire et d'unités périphériques.

Dès l'installation du 2ème Megabyte (1976) l'utilisation de l'unité centrale en batch augmente rapidement pour atteindre une pointe de l'ordre de 180h au cours du 1er trimestre 1980.

La figure 2 reprend l'utilisation de l'unité centrale en mode problème tant en batch qu'en T.S.O. dont la mise en service n'a commencé réellement qu'en 1978. Bien que l'utilisation du C.P.U. soit encore principalement en mode batch, 10% environ du total est dédié à T.S.O.

Les valeurs indiquées ne se réfèrent qu'au travail en mode problème et non à la charge totale et ne comprennent pas l'"overhead", c'est-à-dire l'utilisation de l'unité centrale pour gérer l'ensemble de l'ordinateur. Nous avons pendant quelques jours du mois de juin 1980 et pendant des périodes de 3 heures mis l'ordinateur sous contrôle afin de nous rendre compte de sa charge réelle et non pas seulement de celle résultant du mode problème.

L'instrument mis en oeuvre est un programme captant différents paramètres et que nous avons déjà utilisé précédemment pour tenter d'améliorer le rendement de l'installation (tuning). La charge supplémentaire créée par ce programme de captage est insignifiante (de l'ordre de 2%).

De façon à réduire au minimum cette charge supplémentaire nous nous sommes limités à un très petit nombre de paramètres

- l'utilisation globale du C.P.U.
- l'utilisation des 2 canaux dédiés aux unités à disques

Les périodes mesurées sont:

	9.00-12.00	14.30-17.30	19.30-22.00
le mardi 10 juin	fig.3		
le mercredi 11 juin	fig.4	fig.5	
le jeudi 12 juin	fig.6	fig.7	fig.8
le vendredi 13 juin	fig.9	fig.10	fig.11

Quoique la période soit brève

- la variabilité de la charge même pendant des périodes similaires de jours différents est assez forte;
- la variabilité de la charge au cours des différentes périodes d'une même journée est fort sensible.

Les graphiques de haut de page comprennent:

- le pourcentage d'utilisation globale de l'unité centrale
- le pourcentage de temps pendant lequel l'unité centrale était active en même temps que au moins un des 2 canaux
- le pourcentage de temps pendant lequel l'unité centrale était active en même temps que les 2 canaux

Les graphiques de bas de page comprennent:

- le pourcentage de temps pendant lequel au moins un canal était actif
- le pourcentage de temps pendant lequel le premier canal était actif
- le pourcentage de temps pendant lequel le 2ème canal était actif
- le pourcentage de temps pendant lequel les 2 canaux étaient tous 2 actifs

Les remarques les plus évidentes sont que au cours de certaines périodes et notamment l'après midi les 2 canaux étaient occupés en même temps pendant 25% du temps ce qui explique évidemment la lenteur de certaines applications conversationnelles pendant ces périodes.

L'unité de calcul était pratiquement saturée (utilisée à 100%) pendant les mêmes périodes.

Le soir l'exécution des gros programmes scientifiques réduisait très fortement l'activité des canaux et l'activité du C.P.U. était presque de 100% sauf pour quelques gros programmes particulièrement mal équilibrés (tantôt C.P.U. bound et tantôt I/O bound).

Nous ne voudrions pas ennuyer le lecteur par une analyse plus détaillée et nous laissons celle-ci aux soins de ceux qui sont particulièrement intéressés par ce genre de problème.

Notre conclusion est simplement que pendant les heures normales de travail (de 8.30 à 17.30) l'ordinateur était surchargé et ne pouvait plus fournir un service satisfaisant les utilisateurs. Espérons que son successeur se montrera à la hauteur de la tâche.

DAL 1972 VALORI MEDI PER TRIMESTRE

- # JOBS
- ▨ # I/O
- ▧ TEMPO-EO
- CPU

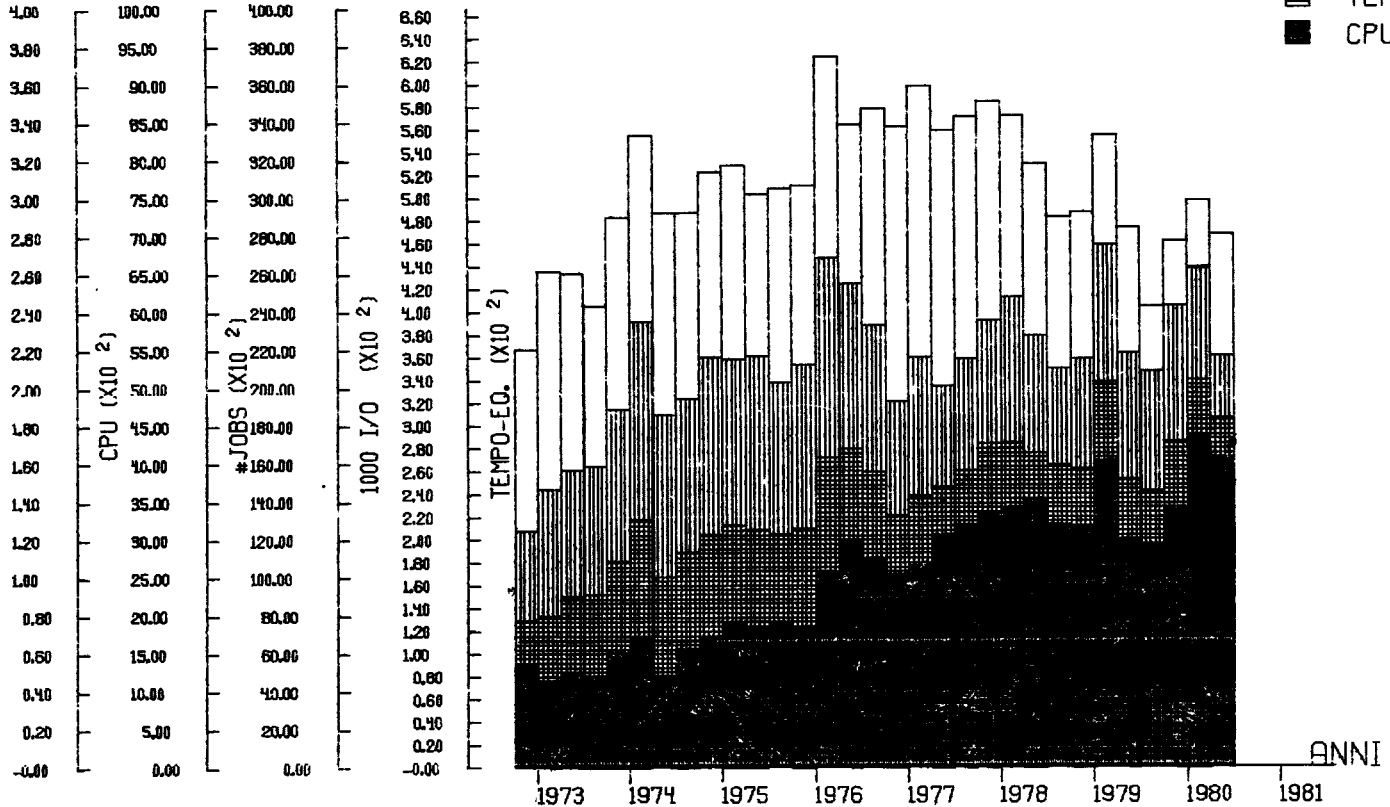


Fig. 1

CONFRONTO CPU BATCH-CPU TSO

▨ CPU BATCH
■ CPU TSO

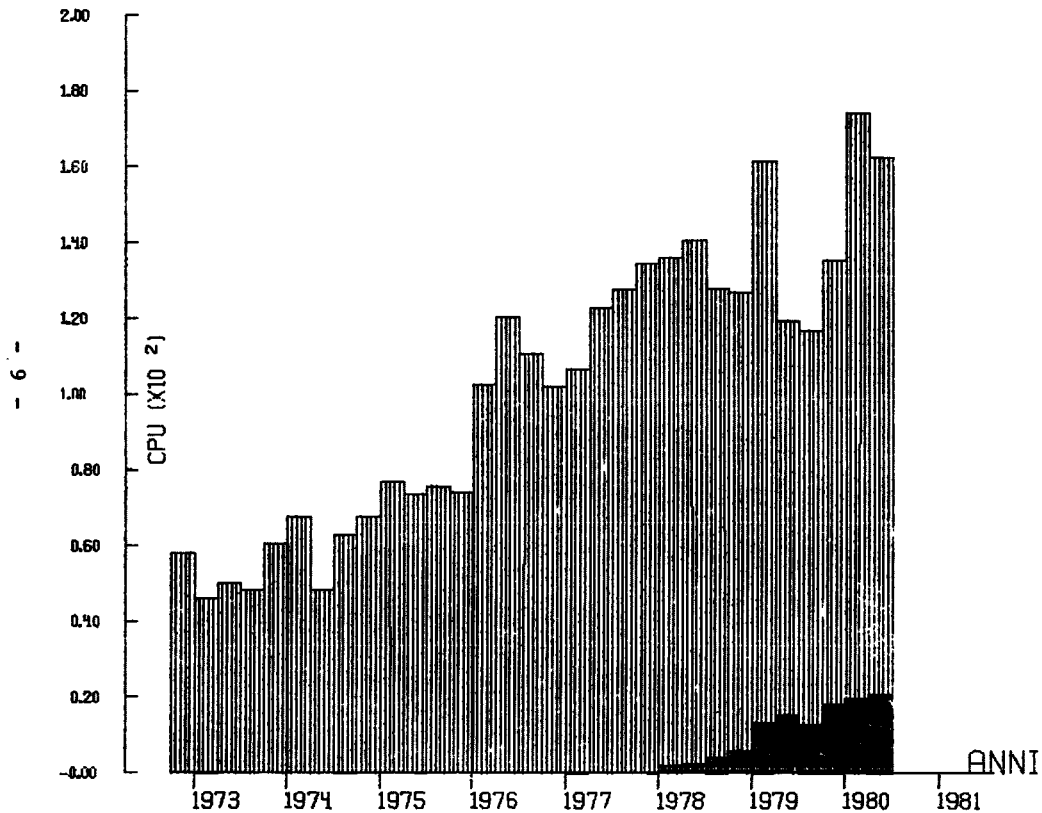


Fig. II

Fig. III

OSPT 10/6/80 DALLE ORE 9.00 ALLE ORE 12.00

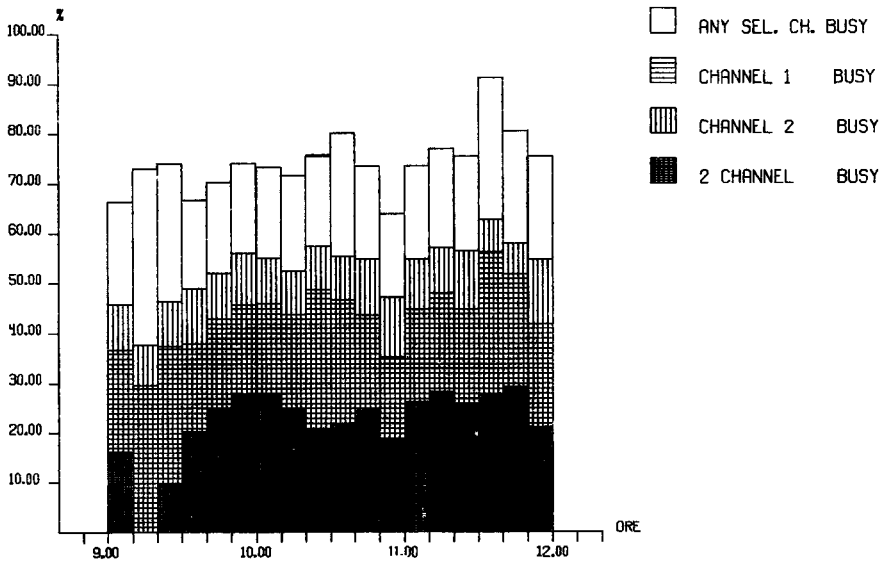
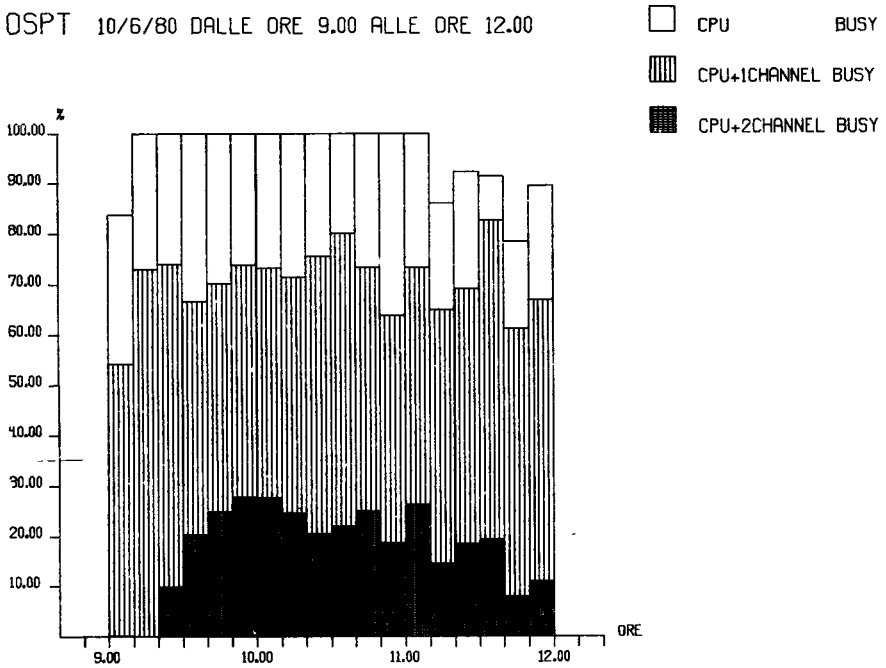


Fig. IV

OSPT 11/6/80 DALLE ORE 9.00 ALLE ORE 12.00

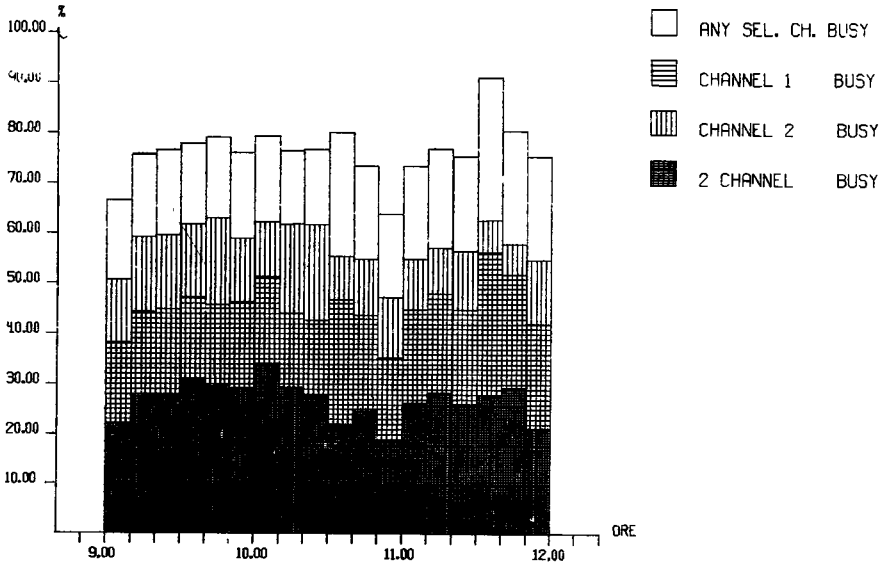
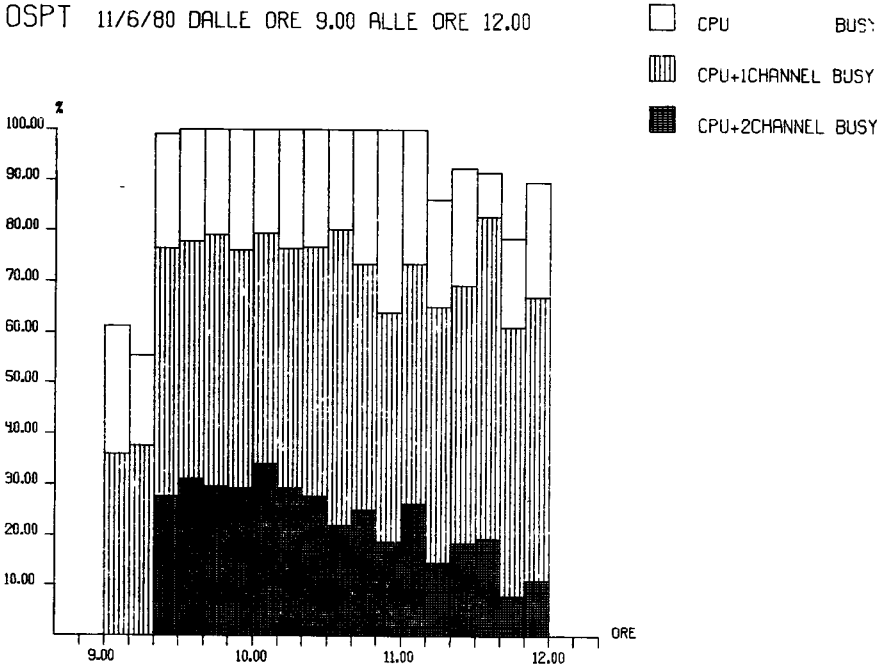


Fig. V

DSPT 11/6/80 DALLE ORE 14.30 ALLE ORE 17.30

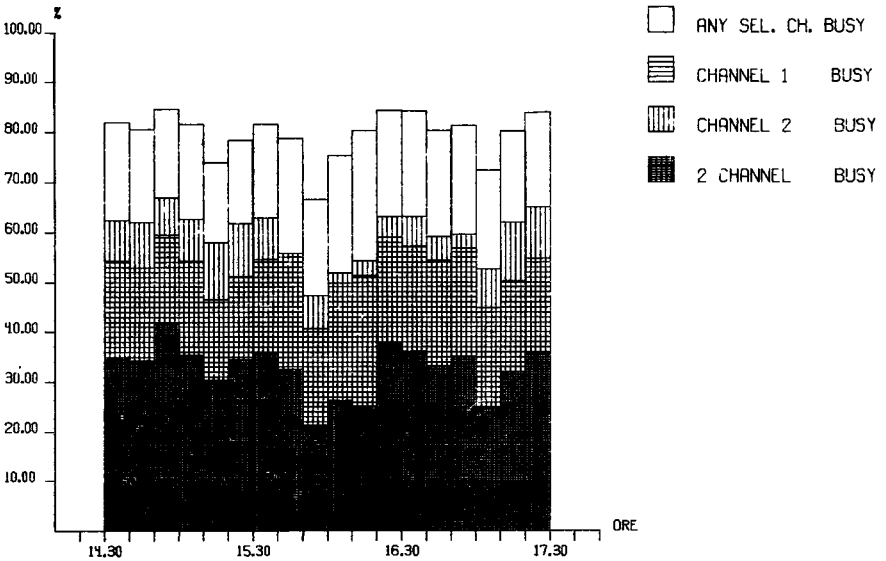
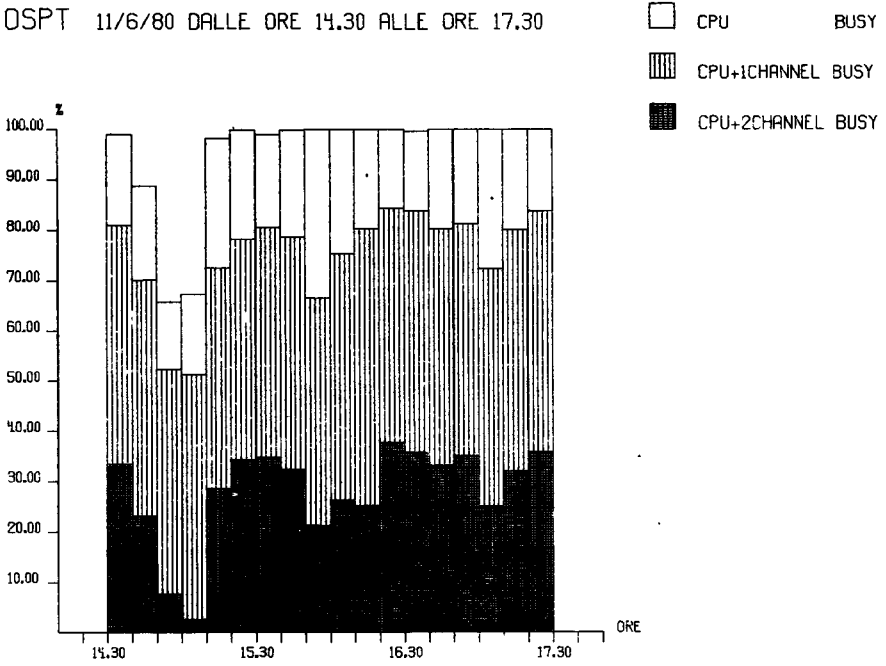


Fig. VI

OSPT 12/6/80 DALLE ORE 09.00 ALLE ORE 12.00

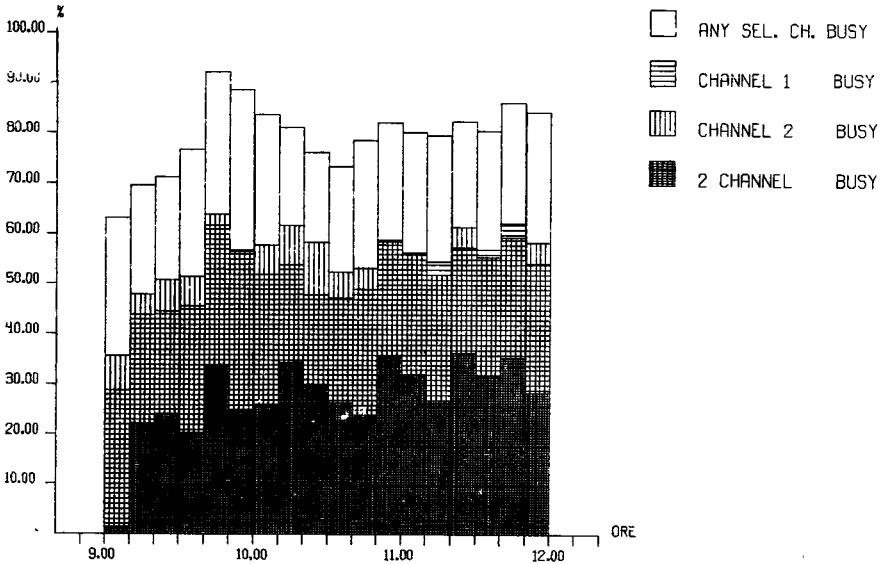
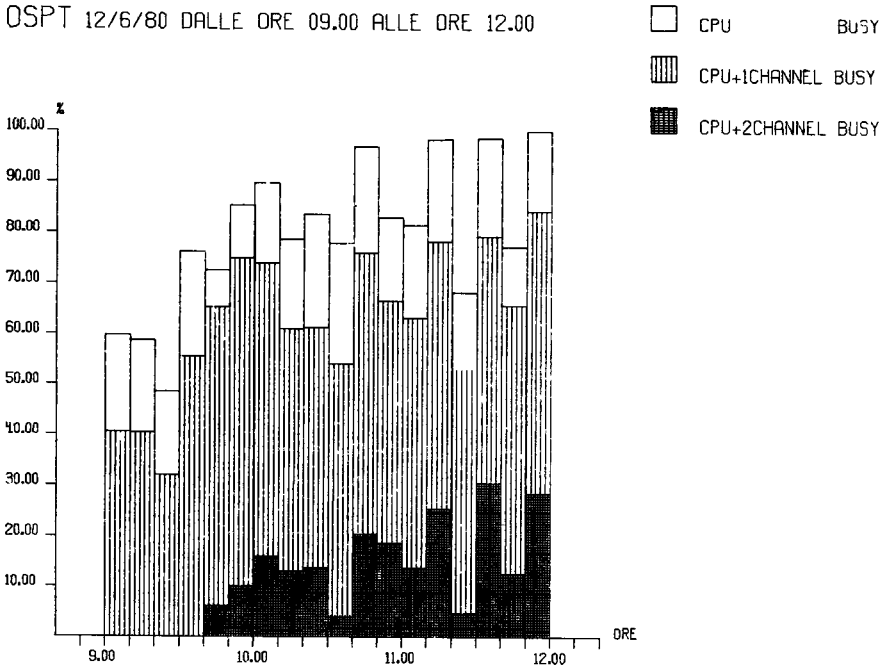


Fig. VII

OSPT 12/6/80 DALLE ORE 14.30 ALLE ORE 17.30

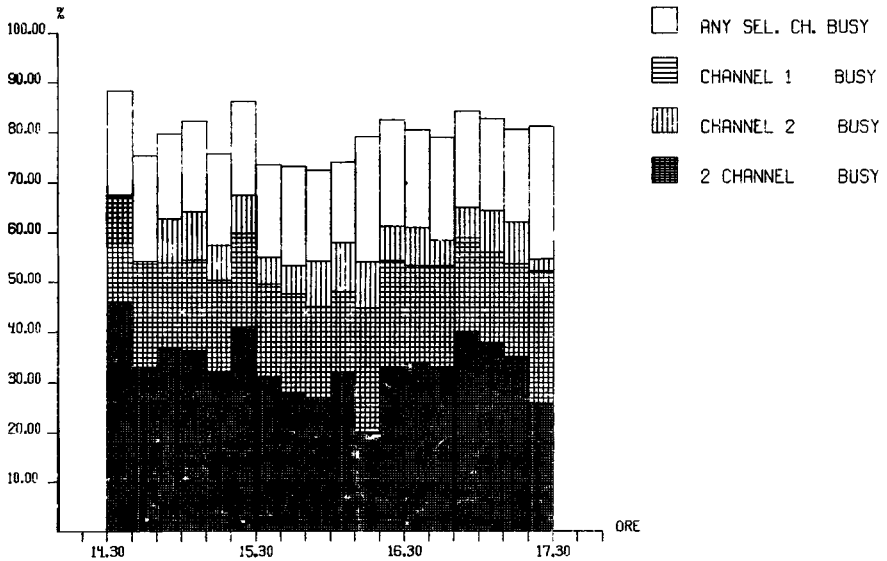
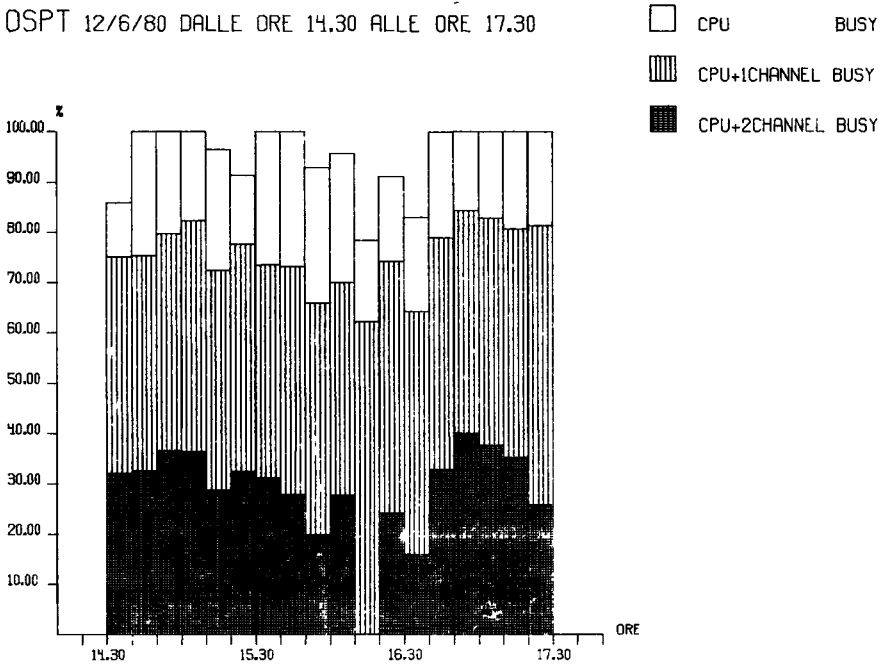


Fig. VIII

OSPT 12/6/80 DALLE ORE 19.30 ALLE ORE 22.30

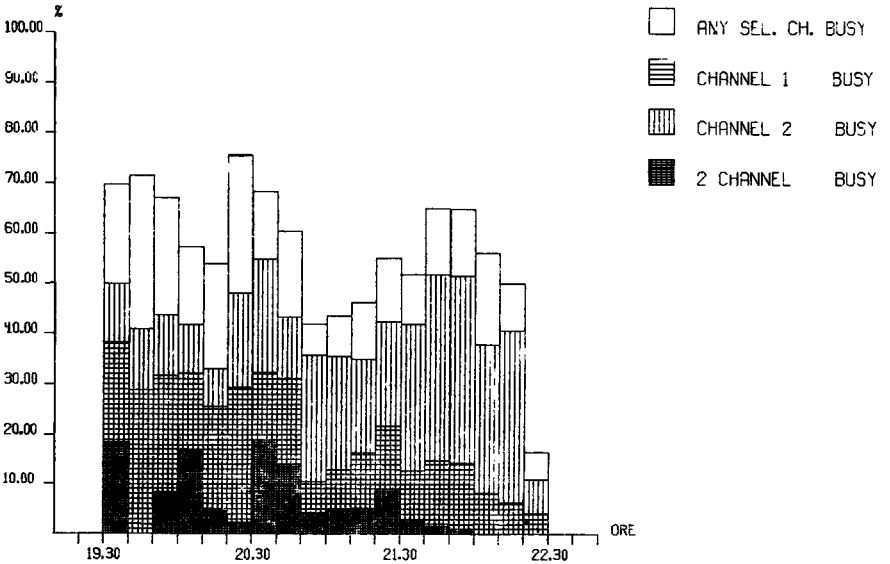
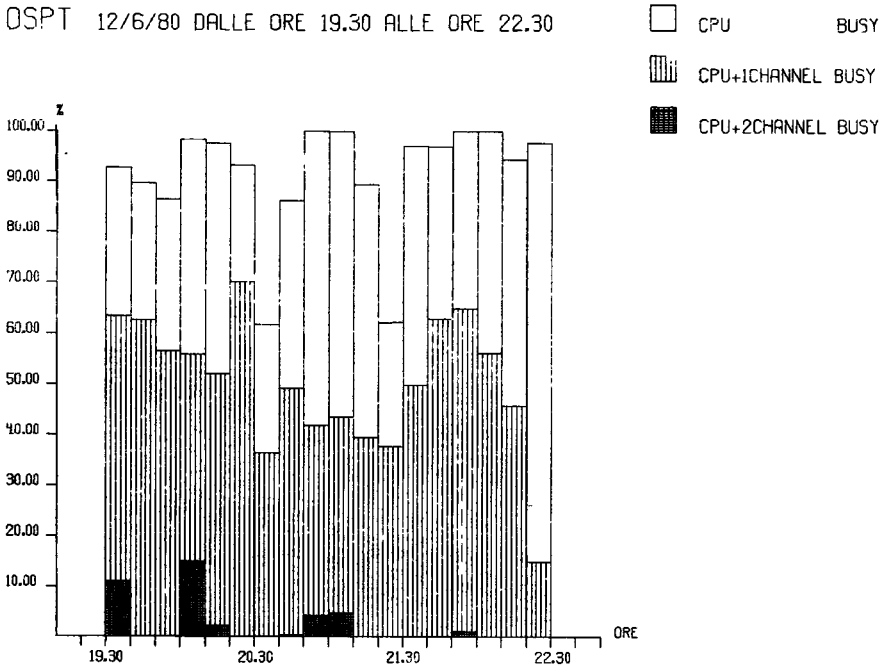


Fig. IX

OSPT 13/6/80 DALLE ORE 09.00 ALLE ORE 12.00

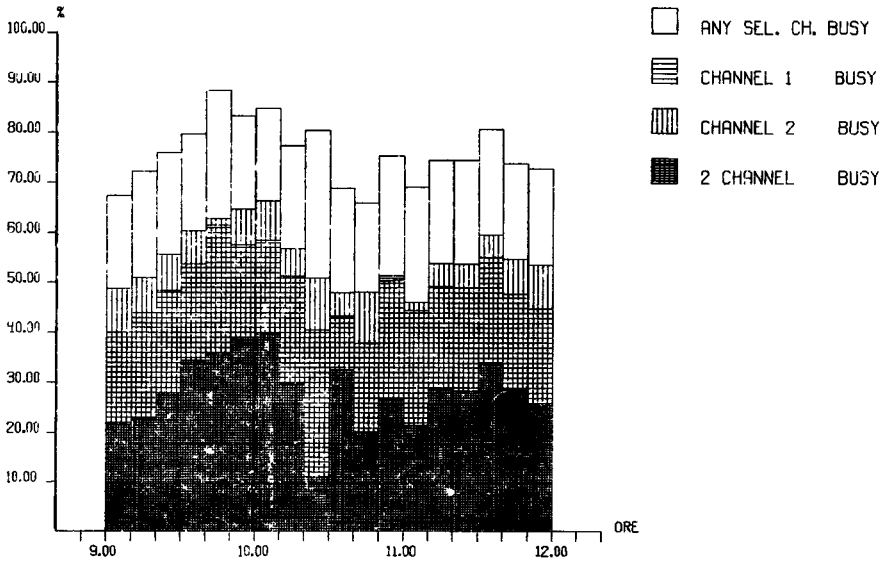
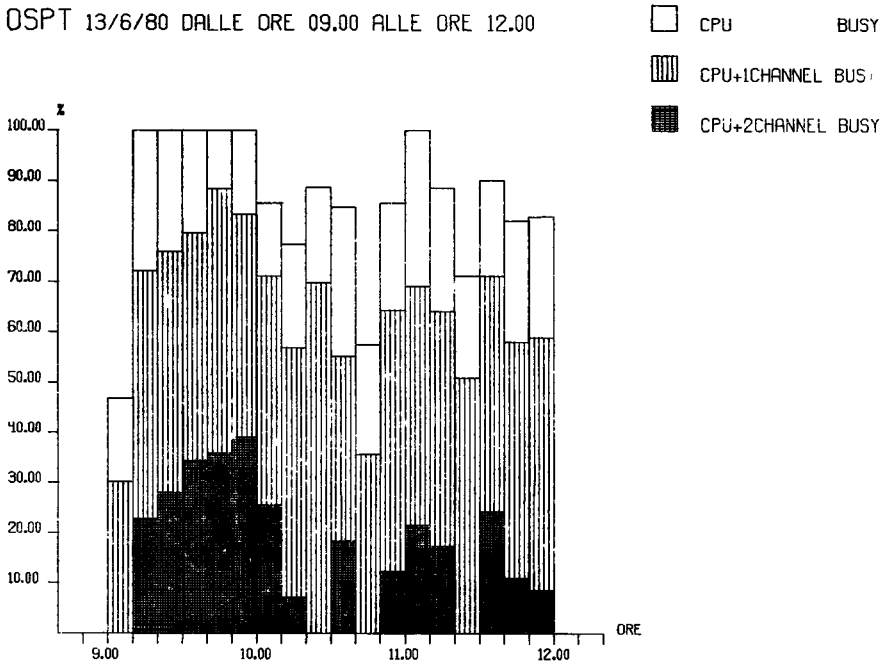


Fig. X

OSPT 13/6/80 DALLE ORE 14.30 ALLE ORE 17.30

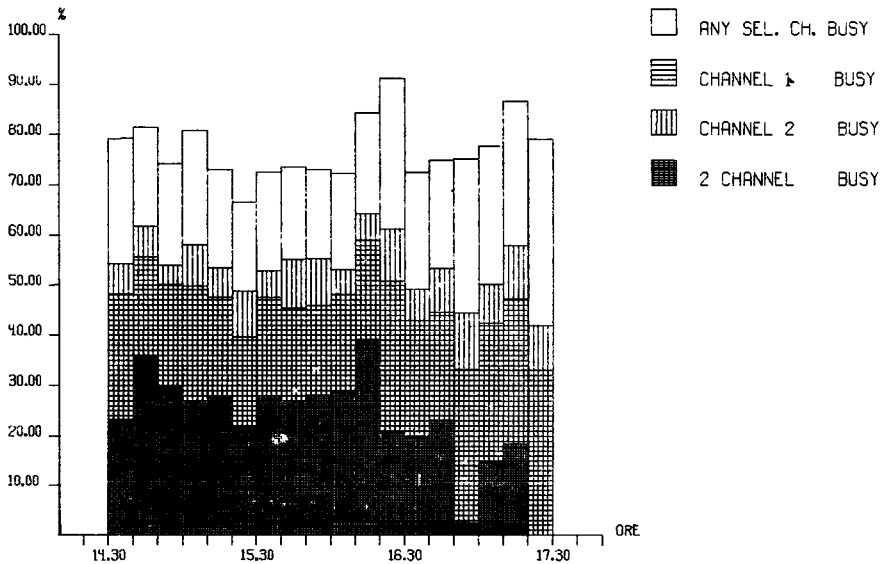
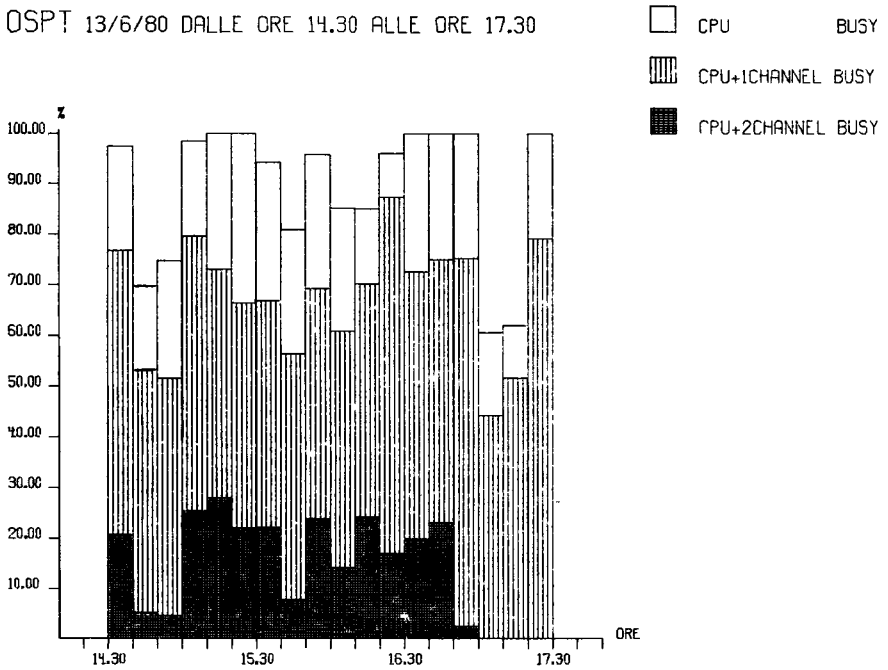
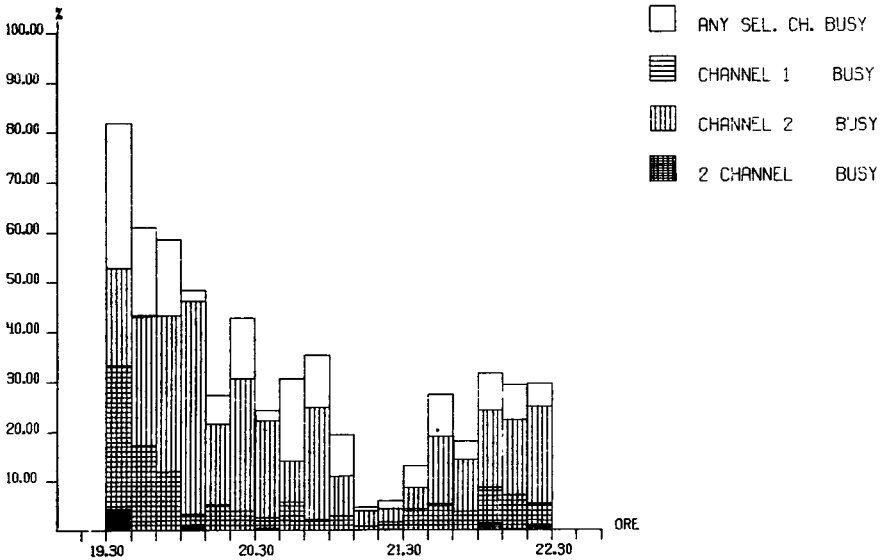
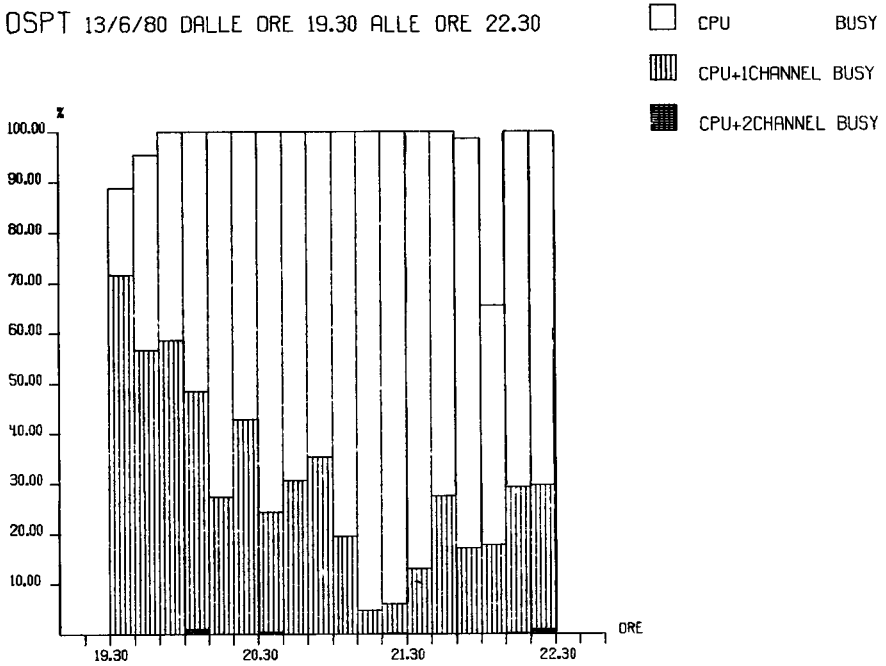


Fig. XI

OSPT 13/6/80 DALLE ORE 19.30 ALLE ORE 22.30



QED NOTES

M. Dowell

Introduction

In the Newsletter No. 42, May 1980 some details were given about the T.U.C.C. Q.E.D. Editor which is now available for use on the TSO system. This is the first of an occasional series of articles giving some notes on the use of the additional facilities of the QED Editor (as compared with the normal EDIT system).

The ALTER Subcommand of QED

The ALTER subcommand is one which is not available using the standard TSO Editor.

The ALTER subcommand is used to modify a record. The entire record will be displayed at the user's terminal and then the terminal carriage (or the cursor on a V.D.U.) will be positioned on the next line at a suitable point to enable the user to change the string of characters which has been requested.

Full specification of the ALTER Subcommand

$$\left\{ \begin{array}{l} \text{ALTER} \\ \text{A} \end{array} \right\} \left[\begin{array}{l} * \\ \text{line-no.1} \{\text{line-no.2}\} \\ * \text{ [count]} \end{array} \right] \left\{ \begin{array}{l} \text{carriage-position-count} \\ \text{carriage position-string} \end{array} \right\} \left[\text{ALL} \right]$$

(for full details of the syntax notation see the IBM manual: TSO Command Language Reference [GC28-6732])

Definition of Operands

line-no.-1

specifies the line which is to be altered (or the start of the range of lines when used in conjunction with line-no.-2)

line-no.-2

specifies the last line of a range of lines to be altered. The specified range of lines are scanned (starting at line-no.-1) until an occurrence of the string (specified in the carriage-position-string operand) is found. The record is displayed and the cursor (or carriage) is then positioned under the string. The user may then enter a replacement string.

If the ALL operand is specified then this procedure is repeated for all occurrences of the specified string within the specified range of lines.

*

specifies that the line to be altered is the line indicated by the current line pointer. This is the default if no line (or range of lines is specified).

count

specifies the number of lines you want to alter, starting at the position indicated by the asterisk.

carriage-position-count

specifies the numeric position in the displayed record at which the amendment is to begin (the first character of the record is position 1). The record is displayed and the cursor (or carriage) is positioned on the next line, under the specified character position. The user may then enter replacement characters for those immediately above. Note that if carriage-position-count is specified with a range of lines, then the ALTER will be performed for all of the range of lines. This will occur even if the ALL operand is not given.

carriage-position-string

specifies a character string which is to be located in the appropriate record(s). The start of this string defines the position in the record at which the amendment is to begin. The record is displayed and the cursor (or carriage) is positioned on the next line under the start of the specified string. The user may then enter replacement characters for these immediately above. The rules for delimiting this string are the same as in the FIND subcommand of EDIT (or QED).

ALL

specifies that every line within the specified range of lines which contains the string carriage-position-string should be processed by the ALTER subcommand. Only the first occurrence of a string on any line will be found. If the ALL operand is omitted and a range of lines is specified, then the ALTER will end after the first occurrence of carriage-position-string.

Physical Terminal Considerations

On IBM 3270 terminals lines typed by the user are always offset by one position to the right. Because of this action, it is not convenient to use the ALTER subcommand with such terminals. However, for other terminals (such as 2741 and Hazeltine 1500) the ALTER subcommand will be most suitable for many situations.

Example

Given the following record (in the data set being edited by QED):

000050 IJKLMABCDE98765432

To change the string ABCDE to 12345 using the "carriage-position-string" facility the user may enter:

ALTER 50 /AB

QED will respond with:

IJKLMABCDE98765432

and the place the terminal carriage (or cursor) under the letter A in the display of record 50.

The user will then enter the string 12345.

The new record will then read:

IJKL1234598765432

Thus, the entire sequence would be:

ALTER 50 /AB ←
IJKLMABCDE98765432 ← lines typed by the user
12345 ←

The same result would be obtained by using the "carriage-position-count" facility in the following way:

ALTER 50 6 ←
IJKLMABCDE98765432 ← lines typed by the user
12345 ←

QED MANUALS

M. Dowell

As already stated in Newsletter No. 42, June 1980 (in the article "TSO Changes"), it is possible to purchase copies of the manual "TUCC TSO Editor-QED" from the Computing Support Library. However, it is also possible to obtain directly a listing of a more up to date version of the manual. This listing, unlike the actual manual, is printed with only capital letters. We now recommend that users make use of the more accurate version of the manual from the listing. Users may obtain a copy of this listing by using the LQEDMAN TSO command procedure in the following way:

```
lqedman (CR)
DATA SET $L$S$T$C.$S$C$R$A.CNTL NOT IN CATALOG
SAVED
UTILITY DATA SET NOT FREED, IS NOT ALLOCATED
ACCOUNTING NUMBER = 88889999:
SPECIFY BOX NO. AND PROGRAMMER'S NAME.
..... (3 NUMERIC AND MAX. 16 ALPHANUMERIC)
aaabbbbbbbb (CR)
YOUR JOB IS NAMED 'TSOXXX' NAD HAS BEEN PASSED TO HASP.
```

In this example the user must type his box number and identification to replace 'aaabbbbbbbb....'.

The listing will be produced and placed in the appropriate box.

A copy of the listing is available for inspection in the Computing Support Library.

Errata Corrigé

In the Newsletter No.43, July 1980 in the statistics given on pages 15 and 16 the month specification should read June 1980 and not July 1980.

Statistics of computing installation utilization.
 Report of computing installation exploitation
 for the month of July 1980.

<u>General</u>	YEAR 1979	YEAR 1980
Number of working days	22 d	23 d
Work hours from 8.00 to 24.00 for	16.00h	16.00h
Duration of scheduled maintenance	22.67h	15.84h
Duration of unexpected maintenance	20.17h	39.52h
Total maintenance time	42.84h	55.36h
Total exploitation time	309.16h	312.64h
CPU time in problem mode	147.80h	183.64h

Batch Processing

Number of jobs	6637	7637
Number of cards input	1572558	1565000
Number of lines printed	22882000	25710000
Number of cards punched	120100	377000
CPU time	131.31h	161.35h
Number of I/O (Disk)	17617000	19563000
Number of I/O (Magnetic tape)	3824000	4024000

T.S.O

Number of LOGON's	2637	3700
Number of messages sent by terminals	153603	267000
Number of messages received by terminals	864813	1684000
CPU time	14.72h	20.91h
Number of I/O (Disk)	1977000	3118000
Connect time	1662.89h	2785.84h

IFS

Total time service is available	110.77h	91.66h
CPU time	1.77h	1.38h
Number of I/O (Disk)	544300	283000

Utilisation of computer centre' by objectives and appropriation
accounts for the month of July 1980.

	IR' 370/165 equivalent time in hours
1.20.2 General Services - Administration - Ispra	38.82
1.20.3 General Services - Technical - Ispra	0.41
1.30.3 Central Workshop	0.72
1.30.4 L.M.A.	-
33001 Reactor Safety	189.09
33002 Plutonium Fuel and Actinide Research	0.21
33003 Nuclear Materials	8.19
33004 Safeguards	9.37
33011 Solar Energy	0.06
33012 Hydrogen	0.33
33013 Design Studies on Thermonuclear Fusion	21.99
33021 Environment and Resources	12.21
33030 METRE	3.06
33041 Informatics	50.80
33044 Training	-
33046 Support to the Commission	5.89
33300 ESSOR	45.83
TOTAL	386.98
1.94.0 Services to External Users	7.00
TOTAL	393.98

BATCH PROCESSING DISTRIBUTED BY REQUESTED COPE MEMORY SIZE

	100	200	300	400	600	800	1000	1200	1400	>1400
No. of jobs	2380	2187	982	1102	375	55	8	118	18	-
Elapsed time	77	168	156	280	127	10	18	23	16	-
CPU time	3.0	22.9	24.0	59.8	24.3	2.4	9.0	7.9	4.4	-
"Equiv" time	24	49	50	100	40	4	9	9	8	-
"Turn" time	1.2	2.5	4.2	3.5	4.3	4.5	7.5	5.3	6.4	-
I/O (disk)	2143	3421	3654	5260	2208	264	43	112	451	-
I/O (tape)	1934	709	197	969	189	1	-	2	3	-

NOTE.

All times are in hours.

"Equiv" means equivalent.

"Turn" means turn around.

All I/O transfers are measured in 1000's.

PERCENTAGE OF JOBS FINISHED IN LESS THAN

TIME	15mn	30mn	1hr	2hrs	4hrs	8hrs	1day	2day	3day	6day
%year 1979	31	47	62	76	88	93	99	100	100	100
%year 1980	25	38	51	64	78	92	98	100	100	100

For histogram of equivalent time

please see page 29.

Statistics of computing installation utilization,
 Report of computing installation exploitation
 for the month of August 1980.

YEAR 1979 YEAR 1980

General

Number of working days	22 d	8 d
Work hours from 8.00 to 24.00 for	16,00h	16,00h
Duration of scheduled maintenance	19,67h	10,34h
Duration of unexpected maintenance	48,17h	9,84h
Total maintenance time	67,84h	20,18h
Total exploitation time	244,16h	107,82h
CPU time in problem mode	110,97h	34,40h

Batch Processing

Number of jobs	5195	2491
Number of cards input	1091700	371300
Number of lines printed	17087500	7201000
Number of cards punched	70900	104000
CPU time	99,54h	30,03h
Number of I/O (Disk)	15329600	5997000
Number of I/O (Magnetic tape)	3367200	1615000

T.S.O

Number of LOGON's	1907	1189
Number of messages sent by terminals	112000	81800
Number of messages received by terminals	630917	570300
CPU time	9,95h	4,21h
Number of I/O (Disk)	1537200	954000
Connect time	1214,67h	699,90h

IMS

Total time service is available	191,70h	30,90h
CPU time	1,48h	0,16h
Number of I/O (Disk)	417800	88400

Note

In the month of August the central service functioned for only 8 days (due to air-conditioning maintenance).
 3 days were with the IBM 370/165 and 5 days with the AMDAHL 470/V7A.

This explains the unusual and untypical statistics shown on this and the following two pages.

Utilisation of computer centre by objectives and appropriation
accounts for the month of August 1980.

		IBM 370/165 equivalent time in hours
1.20.2	General Services - Administration - Ispra	8.67
1.20.3	General Services - Technical - Ispra	0.13
1.30.3	Central Workshon	0.03
1.30.4	L.M.A.	-
33001	Reactor Safety	45.56
33002	Plutonium Fuel and Actinide Pesearch	0.06
33003	Nuclear Materials	2.18
33004	Safeguards	2.77
33011	Solar Energy	0.04
33012	Hydrogen	0.17
33013	Design Studies on Thermonuclear Fusion	3.28
33021	Environment and Pesources	3.85
33030	METRE	0.20
33041	Informatics	9.39
33044	Training	-
33046	Support to the Commission	2.09
33300	ESSOR	3.12
	TOTAL	81.54
1.94.0	Services to External Users	1.24
	TOTAL	82.78

BATCH PROCESSING DISTRIBUTED BY REQUESTED CORE MEMORY SIZE

	100	200	300	400	600	800	1000	1200	1400	>1400
No. of jobs	814	757	298	265	140	26	4	24	2	-
Elapsed time	24	65	39	52	18	10	0.6	7	0.3	-
CPU time	0.6	4.1	5.7	9.6	3.8	1.4	0.5	2.9	0.0	-
"Equiv" time	8.9	13	15	19	7	3	0.5	4	0.2	-
"Turn" time	1.0	1.4	3.3	3.3	3.3	4.3	1.5	6.0	1.5	-
I/O (disk)	733	1271	1265	1234	503	278	4	89	26	-
I/O (tape)	1047	145	71	304	35	-	-	7	-	-

NOTE.

All times are in hours.

"Equiv" means equivalent.

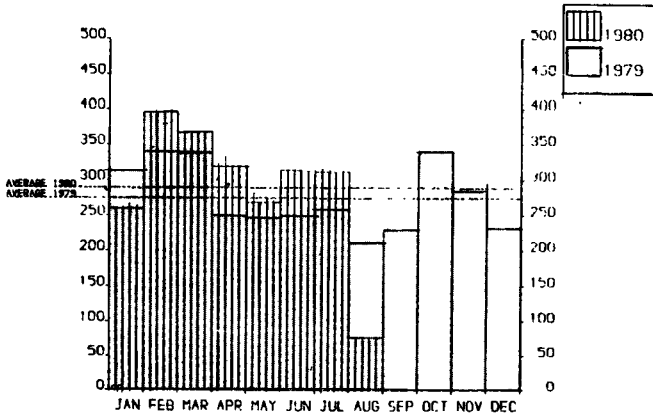
"Turn" means turn around.

All I/O transfers are measured in 1000's.

PERCENTAGE OF JOBS FINISHED IN LESS THAN

TIME	15mn	30mn	1hr	2hrs	4hrs	8hrs	1day	2day	3day	6day
%year 1979	36	50	66	81	92	95	98	100	100	100
%year 1980	44	59	72	82	91	95	98	100	100	100

HISTOGRAM OF TOTAL EQUIVALENT TIME(HRS)



Projected total for 1980 = 3465 hours (using average)

Total for 1979 was = 3292 hours

REFERENCES TO THE PERSONNEL/FUNCTIONS OF THE COMPUTING CENTRE

<u>Manager of The Computing Centre</u>		J.Pire	
Responsible for User Registration	Ms. G.Rambo		
<u>Operations Sector</u>			
Responsible for the Computer Room	A.Binda-Rossetti		
Substituted in case of absence by:			
Responsible for Peripherals	G.Nocera		
<u>Systems Group</u>			
Responsible for the group	D.König		
Substituted in case of absence by:	P.A.Moinil		
Responsible for TSO Registration	C.Daolio		
 		Room	Tele.
<u>Informatics Support Sector</u>			
Responsible for the Sector	(f.f.) H.de Wolde	1983	1259
Secretary	Mrs. G.Hudry	1873	787
Responsible for User Support	H.de Wolde	1383	1259
General Inf./Support Library	Mrs. A.Cambon	1871	730
<u>Advisory Service/List of Consultants(See Note 1)</u>		1870	730
A.Inzaghi		A.A.Pollicini	
R.Meelhuysen	H.I. de Wolde	M.Dowell	

NOTE 1. The advisory service is available in the same room as the Computing Support Library (room 1870). Exact details of the advisory service times for a specific week can be found at the head of any output listing (for that week).

Any informatics problem may be raised. However, the service is not designed to help users with problems which are their sole responsibility. For example, debugging of the logic of programs and requests for information which can easily be retrieved from available documentation.

If necessary, other competent personnel from the informatics division may be contacted by the consultant but not directly by the users.

The users should only contact the person who is the consultant for that specific day and only during the specified hours. Outside the specified hours general information may be requested from Mrs. A. Cambon in the Computing Support Library.

HOW TO OBTAIN COMPUTING CENTRE DOCUMENTATION.

Persons interested in receiving copies of the Computing Centre "green books" or in receiving regularly the "Computing Centre Newsletter" are requested to complete the appropriate part of the following form and send it to :-

Ms. A. Carbon
Support To Computing
Building 36
Tel. 730.

Indicate with a (✓) which options are required.

Please add my name to Newsletter mailing list	()
Please send me copies of the following "green books":	
JRC-TSO Primer	()
GRAPHIT	()
Towards a New Programming Style	()
LIBRARIAN	()

NAME

ADDRESS

.....

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TELEPHONE

